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ABSTRACT

The Cooperative Extension Service improves the diets of low income families through the Expanded Food and Nutrition Education Program (EFNEP). In 1980 and 1983, low income homemakers with young children were chosen from eight counties in Georgia to participate in the program. The 24-Hour Food Recall instrument assessed the number of servings from the four food groups in the 24-hour interval before the interview; the Food Behavior Checklist assessed the subjects' knowledge of the four food groups, food purchasing, food storage and sanitation, meal planning, and food preparation. The instructional design of the 1980 program was indeterminant; the content was determined by the subjects, the aides, and the needs indicated by the subjects' scores on the Food Behavior Checklist. By contrast, the instructional design of the 1983 program was determinant; the program employed a core curriculum including 20 lessons and 16 optional lessons. Sixty-seven subjects in 1980 and 201 subjects in 1983 had complete pre- and post-test data gathered by the aides. According to the data, both programs improved food knowledge and eating habits; increases in scores in the two programs were not significantly different; and no relationship was apparent between the scores and the length of time spent in the program. Three tables are included. (RG)

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EVALUATING NUTRITION EDUCATION PROGRAMS: A COMPARATIVE STUDY OF TWO CURRICULA DESIGNS IN EFNEP

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INTRODUCTION

Since the late 1960's the Cooperative Extension Service has placed special emphasis on improving the diets of low income families with young children through the Expanded Food and Nutrtion Education Program (EFNEP).[1] In recent years resources available to fund such educational efforts have decreased. The number of potential clients, however, has increased. As the number of potential low income clients increases and funding decreases methods are needed to effectively reach more people using existing Extension Service resources.

The purpose of this study was to: (1) compare the changes in scores on the Food Behavior Checklist and 24 Hour Food Recall Instruments, (2) compare time in the program and (3) compare the number of lessons recieved by program participants using both the Determinant and Indeterminant designs.

METHODS

Sample

Participants in this study were drawn from the EFNEP (low income, predominantly black homemakers with small children) population in those Georgia counties which graduated homemakers in both 1980 and 1983. Eight counties participated in the study. In these eight counties the same 58 paraprofessional aides were employed in 1980 and 1983. Lists of homemakers who enrolled in the program were obtained from local Extension agents. Only those homemakers for which complete pre and post test data was available were included in the study. Based on Extension office records a total of 67 homemakers in 1980 and 201 homemakers in 1983 had completed data. The information collected from these homemakers during their participation in the program formed our data base.

Data were collected by paraprofessional aides in interviews before the first lesson was administered and after the last lesson was completed. Paraprofessional

[1]

aides met with each homemaker on a one-to-one basis. To assure consistency in program implementation and data collection a statewide training was held for para-professional aides on program implementation, assessing serving sizes, interviewing, data collection and recording data.

Instruments

Both Food Recall and Food Behavior Checklist scores were calculated in this study. A Food Recall diet score is calculated based on the number of milk, meat, vegetable/fruit and bread and cereal servings in the 24 hour period preceding the interview. Food recall scores range from zero to one hundred. The higher the number of servings in the various food groups, the higher the score.

The Food Behavior Checklist is a 35 item instrument designed to measure a person's knowledge of the four food groups, food purchasing practices, food storage and sanitation practices, food and meal planning, and food preparation practices. A percentage score based on the total number of items answered correctly divided by the total number of items attempted by the homemaker is computed. Scores range from zero to one hundred, the higher the score, the greater the homemakers knowledge. Based on previous research (1, 2) these measurement techniques were felt to be reliable and provide the best cost-to-benefit tradeoff among available methods for measuring food intake and nutrition knowledge in non-instutitional settings.

Curricula

Two curricula designs were used in instructing the participants in the program. The instructional design used in 1980 was indeterminant. The 1980 homemakers were taught from a set of 33 lessons designed by State Extension specialists on various nutrition topics. EFNEP homemakers were given lessons on subject matter content jointly determined by the homemaker, and the paraprofessional aide and the observed needs as recorded by the aide on the Food Behavior Checklist.

Subject matter could be repeated if improved nutrition behavior was not recorded by the aides on the Food Behavior Checklist. There was no set sequence of lessons, frequency of instruction or enrollment period.The instructional design used in 1983 was determinant. The 1983 graduates were taught using a core curriculum designed by a task force of county agents and state specialists. The core curriculum contained twenty core lessons and sixteen optional lessons. The optional lessons were given when interest was expressed by the homemaker. They included two maternal and infant nutrition lessons, one preschooler nutrition lesson, three food preservation lessons, four gardening lessons, and six weight control lessons.In the determinant method, using the core curriculum, aide visits occurred at least twice monthly, teaching one lesson per visit. Homemakers were graduated after the 20 core curriculum lessons and any optional lessons were completed.

Data Analysis

The t test for independent samples was used to determine significant differences between Food Recall Scores, Food Behavior Checklist scores, and time enrolled in both the 1980 and 1983 programs. Pearson product Moment Coefficients were generated to test the relationships between Food Recall scores and time in the program and number of lessons. All statistical analysis were done with the SAS computer program.

FINDINGS

The results showed that both graduation Food Recall and graduation Food Behavior Check List scores were higher than the beginning Food Recall and Food Behavior Checklist scores for both the 1980 (indeterment) and 1983 (determinant) programs.

(Table 1 about here)

The mean enrollment time significantly declined ($p<.05$) from 25.4 months enrolled by 1980 graduates to 19.2 months enrolled by 1983 graduates (Table 2). The mean number of lessons taught per homemaker declined significantly ($p<.05$) from 23.9 lessons in 1980 to 21.1 in 1983.

(Table 2 about here)

In analyzing the data we found the mean beginning food recall scores to be 44.2 for the 1980 homemakers and 45.4 for the 1983 homemakers. The mean Graduation Food Recall scores were 78.6 for the 1980 group and 73.9 for the 1983 group (Table 1). The change in Food Recall Scores between the beginning score and graduation score was 33.8 for homemakers in the 1980 program and 28.4 for homemakers in the 1983 program. Although the mean gain in scores (28.4) for the 1983 homemakers was less than the gain in scores (33.8) for the 1980 group of homemakers, the difference was not significant (Table 2).

Analyses of the Food Behavior Checklist data revealed the mean beginning scores to be 58.1 for the 1980 homemaker and 42.7 for the 1983 homemakers (Table 1). Graduation Food Behavior Checklist Scores were 83.8 for the 1980 homemakers and 79.6 for the 1983 homemakers (Table 1). The mean gains between beginning and graduation checklist scores increased significantly from 25.7 in 1980 to 36.9 in 1983 (Table 2).

(Table 3 about here)

For the 1980 graduates, mooderate associations, significant at the .05 level, were found between length of time in the program and graduation Food Recall score (r = .45) and between length of time in the program and gain in Food Recall score (r=.59) and between number of lessons taught and gain in Food Recall scores (r=.45) (Table 3). Homemakers, who graduated from the indeterminant program in 1980, were more likely to have higher graduation Food Recall scores and higher gains in Food Recall scores if they remained in the program for a longer period of time or received a greater number of lessons.

Interpretations of these relationships, however, must consider other factors. The Food Recall procedure measures one particular homemaker activity, on which encouragement from a paraprofessional aide would be expected to have a strong impact. Linder (3) noted the presence of the Hawthorne Effect in the early part of the EFNEP program he studied. Green (4) noted that aides tended to keep homemakers, who needed moral support, in the program for long periods of time.

Relationships between Food Recall scores and number of lessons taught and length of time in the program for the 1983 determinant method are presented in Table 3. A low positive association (r=.21) was found between time in the program and graduation Food Recall score. A low positive association (r=.15) was also found between gain in Food Recall score and number of lessons or between time in the program and gain in Food Recall scores (Table 3).

Previous literature (3,4,5) has noted the occurrence of the "leveling off phenomenon," whereby individuals would remain in the program without gaining addi-

tional knowledge or making additional improvements in consumption practices, regardless of length of enrollment or number of lessons taught. This leveling off seems to begin somewhere between twelve and eighteen months after enrollment (3,4).

Pearson r correlation data from the 1983 determinant program tends to support evidence for the leveling off effect, but data from the 1980 indeterminant program indicates that additional benefits are derived from continuation in the program for longer periods of time. Thus, findings in this study indicate that Food Recall scores are associated with time in the program and number of lessons received.

Homemakers in both the 1980 and 1983 programs who received more lessons and were enrolled in the program for a longer period of time did not necessarily achieve higher Food Behavior Check List scores. (Table 3).

No significant associations existed between time in the program and graduation Food Behavior Check List scores and gain in Food Behavior Check List scores. No significant association was found between graduation Food Behavior Check List scores and number of lessons received. A moderate negative association existed between gain in Food Behavior Check List scores and number of lessons (r=-.33) (Table 3). On the basis of the 1980 data, we could not state that Food Behavior Check List scores are related to time in the program and number of lessons received.

A correlation analysis of the Food Behavior Check List variables for the 1983 determinant program revealed that a low positive association (r=.27) existed between graduation Food Behavior Check List scores and time in the program (Table 3). No other significant relationships existed between the variables. On the basis of the 1983 data, we could not state that Food Behavior Check List scores are related to time in the program and number of lessons received.

CONCLUSIONS

Examination of the data shows that both the 1980 indeterminant program and the 1983 determinant program resulted in significant improvements in nutrition and food knowledge and in consumption practices by EFNEP homemakers. Increases in scores in the two programs are not significantly different according to statistical analysis of Food Recall data. According to analysis of Food Behavior Check List data, scores were significantly higher in the 1983 determinant program; however, the 1983 graduates started out with significantly lower beginning Food Behavior Check List scores.

No definite correlation trends between Food Recall and Food Behavior Check List scores and length of time in the program and number of lessons could be detected from the data. Although it appears from correlation results of 1980 Food Recall data that higher Food Recall Scores are moderately positively associated with length of time and number of lessons, the 1983 Food Recall data do not support this conclusion. Review of previous research and analysis of the data from this study indicated that the nature of the EFNEP program, the non-linear nature of knowledge gain by EFNEP homemakers, the personal relationships of aides and homemakers, and the "leveling off" phenomenon may account for the results of the correlations between the variables for both programs.

Finally the determinant program results in significantly decreased enrollment time of EFNEP homemakers. With Extension Services experiencing Federal funding cutbacks under Gramm-Rudman, programs that increase the efficiency of instruction will be needed as resources become scarcer.

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NOTES

1. EFNEP is a nationwide program of nutrition education funded by the U.S. Department of Agriculture and administered by land grant universities through local Cooperative Extension Services.

TABLE 1

Mean Beginning and Mean Graduation
Food Recall and Food Behavior Checklist
Scores for Both the Indeterminant (1980)
and Determinant (1983) Programs

	n	Mean Beginning Score	Mean Graduation Score
Food Recall			
Indeterminant (1980)	67	44.2	78.6
Determinant (1983)	201	45.4	73.9
Food Behavior Checklist			
Indeterminant (1980)	67	58.1	83.8
Determinant (1983)	201	42.7	79.6

TABLE 2

Tests of Significance Between Method of Instruction and Time Enrolled, Gain in Food Recall Scores, Gain in Food Behavior Check List Scores, and Number of Lessons

Variable	n	Mean	SD	t
Time enrolled in program (months) and				
Indeterminant Method (1983)	67	25.4	9.13	6.90[a]
Determinant Method (1983)	201	19.2	5.10	
Gain in Food Recall Scores and				
Indeterminant Method (1980)	67	33.8	25.64	1.38
Determinant Method (1983)	201	28.4	28.36	
Gain in Food Behavior Check List Scores and				
Indeterminant Method (1980)	67	25.7	29.5	-2.75[a]
Determinant Method (1983)	201	36.9	23.95	
Number of Lessons				
Indeterminant Method (1980)	67	23.9	5.1	3.11[a]
Determinant Method (1983)	201	21.1	11.8	

[a] $P < .05$

Table 3

Pearson Product Moment Coefficients for Relationships between Food Recall and Food Behavior Checklist Scores and Time in the Program and Number of Lessons for 1980 and 1983 Graduates

Variables	Time in the Program (Months)	Number of Lessons
1980 Graduates:		
Graduation Food Recall Scores	.45[a] (n=67)	.59[a] (n=67)
Gain in Food Recall Score	.41[a] (n=67)	.45[a] (n=67)
Graduation Food Behavior Checklist Score	-.17 (n=67)	-.21 (n=67)
Gain in Food Behavior Checklist Score	.02 (n=67)	.33[a] (n=67)
1983 Graduates:		
Graduation Food Recall Score	.21[a] (n=201)	.11 (n=201)
Gain in Food Recall Score	.06 (n=201)	.15[a] (n=201)
Graduation Food Behavior Checklist Score	.27[a] (n=201)	.11 (n=201)
Gain in Food Behavior Checklist Score	.11 (n=201)	.05 (n=201)

[a] $P < .05$